Session Four

Succus
Infusions
Decoctions

http://commons.wikimedia.org/wiki/File:Floral_tisane_with_lemon.jpg
Viewed 16/8/14
Session four

- Succi
- Infusions
- Decoctions
- Definitions, advantages and disadvantages of these delivery methods as a dosage form
Succus

- A succus (plural succi) is defined as: “the juice of a medicinal plant”
- Quite literally translates from Latin to mean “juice”. This is where we get the term “succulent”, meaning juicy, from.
- Plants are juiced by pulping or bruising the plant material and then pressing out the juice.

(Adams & Tan, 2006, p.30)
Succus

- This is a favourite method by many herbalists to capture the vitality of the herb. It is juiced soon after harvesting and cleaning and thus retains the maximum “life force” of the plant, and any vitamin, mineral or enzymatic action it may have.

- Due to the amount of moisture contained within the fresh plant however, it is not viewed as being of as great a potency (phytochemical concentration) in contrast to such methods as liquid extracts or tinctures.
Succus

- *Succi* have been used for time immemorial by the ancients as a treatment for many maladies. Much akin to infusions and decoctions, *Succi* are a crude method of preparation which was obviously all that was available to our herbal forebears.

- They were prepared and consumed immediately, and have also been used topically, such as a succi of *Allium sativum*, which was applied internally and topically to battle wounds by Roman surgeons to stop infection and speed recovery.
History

• *Succi* have been mentioned in traditional herbal pharmacopoeias and *Materia Medica*'s; some dating back thousands of years...

• Certain herbs, such as *Succus Liquiritiae* (*Glycyrrhiza glabra*) were a standard treatment for abdominal discomfort and gastric ulcer for centuries.

An excerpt from a Arabic translation of Dioscorides *Materia Medica* showing herbal medicine manufacture
Succus

- *Taraxacum officinale* (Dandelion)
- Freshly harvested roots that used
- Action on the liver and bowels
- Used in detoxifying protocols

http://commons.wikimedia.org/wiki/File:Dandelion_root.jpg Viewed 16/9/14
Succus

- *Galium aparine* (Cleavers)
- Fleshy aerial parts are used
- A natural lymphatic and diuretic

[Image: http://commons.wikimedia.org/wiki/File:Galium_aparine_002.JPG Viewed 16/9/14]
Succus

- *Urtica dioica* (Nettles)
- Fresh young leaves that are used
- Spring tonic
- Loaded with chlorophyll & used in traditional ‘blood cleansing’ treatments

[Image: http://commons.wikimedia.org/wiki/File:Urtica_dioica_fresh.jpg viewed 16/9/14]
Advantages

- They are a potent way of capturing the vitality of the plant in both chemical and energetic terms.
- Rich in vitamins, minerals and enzymes.
- Relatively easy to manufacture.
Disadvantages

- Fresh juice can contain very high levels of certain chemicals, such as alkaloids, at dangerous levels.
- Succi are therefore only appropriate for certain medicinal herbs.
- They have a very short shelf life (unless EtOH is added).
- Degradation of active constituents and enzymes occurs rapidly.
- Those with an aversion/sensitivity to alcohol will not take a stabilised succus.
- Plants may only be available seasonally.
Preservation

- Generally, the juice is to be preserved with a minimum of 25% Ethanol (EtOH), which is 95 – 98.5% alcohol.

- This means 3 parts of juice and 1 part of EtOH (3:1 ratio). This can be represented by 75mL of Allium sativum juice to 25mL of EtOH.

- With EtOH added, this generally enables a shelf life of around 6 months. Coupled with refrigeration, it can last up to a year.
Preservation

- Better still is using the principal of threes... 1/3 the amount of juice should be EtOH, which equates to about 33%. A higher EtOH content decreases the likelihood of microbial survival.

- Likewise, it can be poured into ice-cube trays and frozen for later use.

- Fresh juices can only be kept longer than 24 hours with ethanol.
Traditional Manufacturing

1) Prepare and disinfect all work areas and equipment.
2) Ensure the herb to be juiced is clean & fresh.
3) Place the allocated amount of herbal material into the juicer and crank vigorously, until the required volume of juice has been collected.
4) Let stand for 5 minutes for sedimentation to occur.
5) Filter the juice to remove any excess sediment (through a fine metallic sieve, but better yet is cheese or muslin cloth)
6) Add the appropriate amount of EtOH to the succus
7) Bottle & label
Bottling and Labelling

- The bottles used in most herbal manufacturing are made of dark amber glass.
- The dark colour protects the herbal material from light, which can detrimentally effect the quality of the active constituents. It can protect against UVA, UVB and UVC wavelengths.
- Strong, easily sterilised and non-reactive material.
Bottling and Labelling

- Non-crystalline structure, can last indefinitely if properly cared for.
- This is proven by the glass bottles that carried the medicines of the first fleet still being in good shape to this day.
- Older still, according to Pliny the Elder, the Phoenicians made the first glassware, and relics still remain today in museums.

http://en.wikipedia.org/wiki/Medical_cannabis
Bottling and Labelling

Things that need to be included on the label of herbal medicinal products include:

1) Name of the medicine
2) Quantity/weight/volume (50mL, 200mL etc.)
3) List of ingredients including plant part
4) Botanical name
5) Source of the herb
Bottling and Labelling

6) Concentration of the herbal formula
   (weight : volume ratio or Drug Extract ratio)
6) Use by date
7) Date of manufacture
8) Storage conditions (keep in a cool place etc)
9) Dosage instructions &
10) Any cautions & contraindications
11) AustL products require batch # documentation
Herbal Medicine

- *Allium sativum* (Garlic)
- *Taraxacum officinale radix* (Dandelion root)
- *Galium aparine* (Cleavers)
- *Glycyrrhiza glabra radix* (Liquorice root)
- *Stellaria media* (Chickweed)
- *Petroselinum crispum* (Parsley)
- *Apium graveolens* (Celery)
- *Calendula officinalis* (Marigold)
- *Echinacea purpurea herba* (Purple Coneflower herb)

(ESCOP Monographs, 2003)
Succus *Allii sativum* BPC 1949

**Ingredients:**
- *Allium sativum* (Garlic) (bulb) 80g
- Ethanol 20mL

**Procedure:**
- Disinfect work area and equipment
- Wash hands thoroughly
- Weigh out ingredients
- Press garlic in juicer.
- Allow to stand and sediment to settle
- Add 20mL of ethanol
- Allow to stand for 14 days, then filter and bottle
- Label bottle.

(Adams & Tan 2006, p31)
Succus *Limonis BPC 1911*

**Ingredients:**
- *Citrus × limon* (Lemon) 90mL
- Ethanol 10mL

**Procedure:**
- Disinfect work area and equipment
- Wash hands thoroughly
- Weigh out ingredients
- Press whole or cut Lemon in juicer.
- Allow to stand and sediment to settle
- Add 10mL of ethanol to make up to 100mL
- Allow to stand for 14 days, then filter and bottle
- Label bottle.
Video on Succi

- Please watch the video on making succi: http://youtu.be/OP5A4QcLGY4
Infusions

- Infusions are commonly referred to as herbal teas
- Based on aqueous extracts that involve steeping (macerating) dried or fresh herbal material in boiling water for a period of time
- This allows the water soluble constituents within the herb to transfer into the water
- Infusions can be cold (better for mucilages/starches) or hot, depending on the action required.

(Adams & Tan 2006, p.32-34)
Infusions

- Infusions are typically made from the fragile or delicate parts of the plant:
  - Leaves and non-woody stems
  - Flowers and flower buds
- The active medicinal constituents in these parts the plant would be ruined if they were boiled

(Adams & Tan 2006, p.32-34)

Thyme Infusion

http://upload.wikimedia.org/wikipedia/commons/a/aa/Thyme_tisane_01.jpg viewed 13/11/14
Fresh Herb Infusions

- Unless otherwise stated, infusions use dried herbal material, as this was the standard used throughout traditional medical practice throughout the ages.
- When using fresh herbal starting material, the moisture content of the herb must be taken into account, as it contributes to water content.
- Water content varies between plant and species
- General guidelines suggest that you should double the weight of the herb (halve the herb to water ratio), which would make it 1:10.

• 60 grams of fresh herb to 600mL water (60-200mL tid) (Adams & Tan 2006, p.32-34)
Fresh Corn Silk Infusion for Urinary Tract Infections

**Ingredients:**

- 60 grams of freshly husked corn silks (3 - 4 cobs of corns yield about 10g silk - depending on how large they are)
- 1L water (silks don’t much moisture)

**Method:**

- Husk your corn carefully reserving the silks
- Pour hot water over the material and leave it for about 5 minutes, strain and drink
Dried Herb Infusions

- This is consistent with the standard set by the US Pharmacopoeia which is expressed as a weight:
  - Volume ratio - drug extract ratio (DER) of 1:20
  - 1 part dried herb to 20 part water

- The standard therapeutic dose in metric terms for an infusion is:
  - 30 grams dried herb in 600mL of boiling water
  - 60 – 200mL three times daily (tid) would be the dose.

(Adams & Tan 2006, p.32-34)
Advantages

- A relatively pleasant way to administer herbal medicines
- No alcohol - can benefit people with sensitivity, recovering alcoholics, pregnant women, L or P plate drivers or those people whose religion forbids alcohol consumption
- When using mucilaginous herbs for a demulcent action, the aqueous medium of a tea is perfect for this type of activity.

(Adams & Tan 2006, p.32-34)
Advantages

- Liver disease or conditions, again, where alcohol is to be avoided.
- Urinary tract infections or stones, as alcohol can cause further inflammation. Also, increasing fluid (water) intake in these conditions is seen as beneficial.
- When a bitter taste is required, say to stimulate digestion, a bitter herb will achieve this as well as a tincture or other liquid preparation.
- When a diaphoretic action is required, taking diaphoretic herbs in a hot tea will increase the diaphoretic activity and speed its onset.

(Adams & Tan 2006, p.32-34)
Disadvantages

- Being based on water, there are no preservative qualities, and therefore, infusions must be prepared daily or when they are needed and consumed soon after preparation. They can be stored in a refrigerator for up to 24 hours.
- Not as convenient as other dosage forms such as capsules or tablets, which decreases patient compliance.
- Taste of certain herbal medicines can be quite unpleasant.
- Generally, a much higher dosage regimen must be observed in infusions than in other liquid dosage forms such as liquid extract, due to the fact that infusions are not as concentrated.

(Adams & Tan 2006, p.32-34)
Infusions

- *British Pharmacopoeia (1914)* gives the rule of thumb 1 ounce of herb to 1 pint of water
- Metric equivalent:
  - 30 g dried herb or 60 g of fresh herb
  - 600 ml of hot water
- Allow herb to infuse into the water 5 mins to 4 hours (depending on what part of the plant you are working with)
YEP Infusion

Ingredients:
- *Achillea millefolium* (aerial parts) 10grams
- *Sambucus nigra* (flowers) 10grams
- *Mentha x piperita* (leaves) 10grams
- Purified water 600mL

Procedure:
- Disinfect work area and equipment
- Wash hands thoroughly
- Weigh out ingredients, use Mortar & pestle if required.
- Boil water and pre-warm vessel.
- Add herbal material. Cover with lid to contain heat.
- Allow to stand for 10-30 minutes (depending on required strength)
- Strain and drink while hot, especially if diaphoretic action is required.

(Adams & Tan 2006, p.35)
Calming Infusion

Ingredients:
- *Matricaria chamomilla* (flowers) 10grams
- *Melissa off.* (flowers) 10grams
- *Lavandula off* (flowers) 10grams
- Purified water 600mL

Procedure:
- Disinfect work area and equipment
- Wash hands thoroughly
- Weigh out ingredients, use Mortar & pestle if required.
- Boil water and pre-warm vessel.
- Add herbal material. Cover with lid to contain heat.
- Allow to stand for 10-30 minutes (depending on required strength)
Decoctions

- Decoctions, unlike infusions, are when one boils or simmers the herbal medicine for a certain time frame (usually circa 30-40 minutes), in water, to allow for the extraction of active constituents.

- Due to this constant exposure to heat, decoctions are not suited for herbs containing volatile or heat sensitive constituents.

(Adams & Tan 2006, p.36)

Decoctions, as depicted above, have played an important part in the history of traditional medicine and also popular mythology.
Decoctions

- The heat used in a decoction is where the “art” comes into play.
- It should not be a fast rolling boil, but rather a gentle simmer.
- Decoctions always start with cold water, which is allowed to steep for a while, before the gentle application of heat.
- Adding boiling water to denser plant materials like roots can cause proteins to coagulate (such as albumin), which provides scientific evidence to support the use of gentle heat.

(Adams & Tan 2006, p.36)
Decoctions

History of decoctions

- Decoctions are perhaps one of the oldest dosage forms, along with raw herb ingestion & infusions.
- The boiling of herbs for pre-determined periods of time has long been employed in multiple paradigms of medicine, but even to this day, decoctions play a big part in Traditional Chinese Medicine.
- The typical “cauldron”, ubiquitous in almost all cultures history, comes from the Latin “caldarium”, which translates as hot bath.

(Adams & Tan 2006, p.36)
16th Century
TCM Preparation

- To the upper right, a man tends to the fire in a stove on which he is steaming herbs
- To the left is a figure in the act of lifting the lid of a pot of boiling herbs to check on the brew
- Centre four people illustrate different stages in drug processing: grinding ingredients in a mortar, sifting them, pulverizing them with a metal roller

viewed 18/9/14
Decoctions

- Decoctions are best manufactured in earthenware, clay vessels. Only use stainless steel or other metal vessels when an earthenware pot is unavailable. Crock pots double quite well as a decoction pot.

- As has been previously said, the parts used in decoction are usually the woodier parts of the plant, such as roots, barks, stems and seeds.

(Adams & Tan 2006, p.36)
Decoctions

- The standard weight to volume ratio for decoctions is similar to that of infusions
- Must account for the evaporation of the water during simmering
- Starting with between 700-900mL you might end up with 600mL of decoction
- Most suitable plant material for decoctions are:
  - Roots and rhizome
  - Barks and heartwood
  - Dried berries

(Adams & Tan 2006, p.36)
Decoctions

- The soaking of the herbal material in cold water before beginning the boiling process also assists in concentrating or strengthening the decoction, by increasing the retention/absorption of active constituents.

- Boiling may also render more poisonous substances less toxic, which may be seen in the TCM model and the decoction of Ephedra sinica.
  - 30gram Dried herbal material in 700-900mL
  - Simmer until reduced to 600mL
  - Dose is 60-200mL three times a day (tid)
Advantages

- There is no alcohol, so can be of benefit to people with sensitivity, recovering alcoholics, pregnant women, L or P plate drivers or those people whose religion forbids alcohol consumption.

- That they are hot which can be beneficial if a diaphoretic action is wanted as the heat will augment the herbs efficacy

(Adams & Tan 2006, p.36)
Disadvantages

- Being based on water, there are no preservative qualities, and therefore, decoctions must be prepared daily or when they are needed and consumed soon after preparation.
- They can be stored in a refrigerator for up to 24 hours.
- The cooking of the herbs can smell out the kitchen.
- Not as convenient as other dosage forms such as capsules or tablets, which decreases patient compliance. More time consuming to prepare than infusions.

(Adams & Tan 2006, p.36)
Disadvantages

- Taste of certain herbal medicines can be quite unpleasant, and with decoctions, one finds they are generally more unpleasant than most infusions due to the time of extraction, and the parts of the plant being extracted (in most instances).

- Generally, a much higher dosage regimen must be observed in decoction than in other liquid dosage forms such as liquid extracts, due to the fact that decoctions are not as concentrated.

- Loss of heat sensitive or volatile constituents (alkaloids)

(Adams & Tan 2006, p.36)
Himalayan Chai

Ingredients

- Zingiber officinalis radix fresh: 10 - 15 grams
- Elettaria cardamomum (pods): 6 x pods, crushed
- Cinnamomum verum (bark): 2 sticks
- Syzygium aromaticum: 6 x cloves
- Purified water: 900mL
- Honey: To taste
- Milk: If desired

Procedure

- Disinfect work area and equipment, Wash hands thoroughly
- Weigh out ingredients, use mortar & pestle if required (Crushing)
- Soak herbal material in water for 10 minutes.
- Bring to gentle boil, then turn down to simmer. Place lid on vessel ajar
- Simmer for 30 minutes. Allow to cool. Strain into bowl.
- Add honey and milk as required.
- Drink whilst hot.

(Adams & Tan 2006, p.36)
Stress Blend

Ingredients

- *Glycyrrhiza glabra* (root) 10g
- *Schisandra sinensis* (berry) 10g
- *Astragalus membranaceus* (root) 10g
- Water 700-900 ml

Procedure

- Disinfect work area and equipment, Wash hands thoroughly
- Weigh out ingredients, use mortar & pestle if required (Crushing)
- Soak herbal material in water for 10 minutes
- Bring to gentle boil, then turn down to simmer. Place lid on vessel ajar
- Simmer for 30 minutes or until reduced to 600mls. Allow to cool.
Valerian Hot Chocolate

Ingredients
• 1 tablespoon of dried *Valeriana officinalis*
• 1 tablespoon of dried *Melissa officinalis*
• 1 tablespoon of dried *Passiflora incarnate*
• 1 teaspoon *Lavendula angustifolia*
• Peel of 1 orange
• 3 cups of full cream milk/coconut milk
• 50g of dark chocolate (50% cocoa solids minimum)
• Dash of vanilla extract (optional)

Procedure
• Combine milk, orange peel and dried herbs in a pot and gently heat for 5-10 minutes. Do not let the mixture boil
• Strain the mixture through a thieve
• Pour the infused milk back into the pot then add dark chocolate and vanilla extract and stir until chocolate has melted. Drink and enjoy 😊

(James Wong’s book ‘Grow Your own Drugs’)

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Video – infusions & decoctions

- Please watch the video on infusions and decoctions: http://youtu.be/kE2xKDWo1HQ
Tutorial Participation

Tasks:
- Participation Forum – participate with your comments every week
- Answer the specific questions for each session on the LMS
- Watch the videos (Links are provided on the slides)
- Consistently work through your Study Guide each week
- If you have any questions for your tutor please contact them via the LMS.
Tutorial Participation

Optional Home-based Tasks:

- Make a lemon succus (Slide 21)
- Make YEP tea (Slide 32)
- Make a Stress Blend decoction (Slide 46)
- Taste your preparations
Suggested Readings


References

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